

Fundamental Indexing: A Verbal Optical Illusion

Michael Edesess, Ph.D.

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For a related discussion of fundamental indexing, see Michael Edesess' article in this issue, [Fundamental Indexing: Breakthrough or Old Idea in New Marketing Garb?](#), and our article, [Fundamental Indexing Debunked](#), which appeared on August 5, 2008

The bedrock argument for fundamental indexing relies on a verbal optical illusion

The “fundamental indexing” debate continues in the January/February 2009 *Journal of Indexing*.

Fundamental indexing can be viewed merely as a low-cost, automated way to tilt a diversified portfolio toward value stocks—a strategy that has a foundation in empirical historical results. That is where fundamental indexing advocates should leave it. But its advocates make a further claim for the practice, one that relies on the argument that the market-cap-weighted portfolio is necessarily overvalued.

This argument depends on frequent repetition of the following statement or statements like it: “Capitalization-weighted indexes overweight overpriced stocks and underweight underpriced stocks.”

This statement and its variations have an illusory effect. The effect is like showing that line A is shorter than line B by drawing arrowheads at the ends of line A and arrow-tails at the ends of line B.

But this statement and its variations are wrong at their core.

The claim is wrong, as shown by using fundamental indexers' own assumptions. They assume that the stock-pricing error is unbiased, so that on average it will be zero. Therefore, the pricing error averaged over the whole stock market is zero. But if the average pricing error of the whole stock market is zero then so is the average pricing error of a market portfolio.¹



The latest versions of the claim

In a debate in the recent *Journal of Indexing* between Paul Kaplan, vice president of quantitative research at Morningstar, and Robert Arnott, chairman and founder of Research Affiliates—a fundamental indexing advocate—Arnott advances two versions of the standard claim. The first is devoid of meaningful content, but sounds reasonable and paves the way for the second version which is simply wrong.

The first takes this form: “[E]very stock that’s trading above its eventual fair value is weighted in the cap-weighted portfolio above that eventual fair value weight, and every company that’s below its fair value is below its fair value weight. If you can just randomize those errors, that does add value.”ⁱⁱ

The first sentence is a tautology, devoid of meaningful content. It says that every stock whose price is greater than its fair value has a price above its fair value, and every company whose price is below its fair value has a price below its fair value. I challenge anyone to find more in it.

Then what can this mean: “If you can just randomize those errors, that does add value?”

The second claim is: “If we have a cap-weighted portfolio, we know most of our money is in companies that are above fair value, whether they’re high or medium or low valuation multiples. We know that they’re going to revert toward fair value over time. And so we know that most of our money is in assets that are going to under-perform and too little is in assets that are going to outperform.”ⁱⁱⁱ

But it is obviously wrong to say that “If we have a cap-weighted portfolio, we know most of our money is in companies that are above fair value.”

Consider a two-company world. Company A has a fair value of \$10 billion with a market value of \$9 billion, and Company B has a fair value of \$5 billion with a market value of \$6 billion. If we have a \$150,000 market-cap-weighted portfolio, it will have \$90,000 in Company A, the undervalued company, and \$60,000 in Company B, the overvalued company. It will not have most of its money in companies that are above fair value—it will have most of its money in the company that is below fair value.

It remains only to wonder why these arguments—which imply claims to mathematical (rather than merely empirical, historical) superiority for fundamental indexing—have received any attention.

ⁱ Mathematically: If P_i is the market price of the i 'th company, V_i is its fair value and $U_i = P_i - V_i$ is the error term, then the expected value of U_i is zero, since it is unbiased. Therefore, the expected value of the difference between the sum of the P_i and the sum of the V_i , which is the sum of the U_i , is also zero. But the sum of the P_i is the market value of the market-cap-weighted portfolio, and the sum of the V_i is its fair value. Therefore, the expected difference between the market-cap-weighted portfolio's market value and its fair value is zero. Hence, the expected overvaluation of a market-cap-weighted portfolio is zero.

ⁱⁱ *Journal of Indexes*, January/February 2009, page 31. Available [here](#).

ⁱⁱⁱ *Ibid.*, page 33.

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